

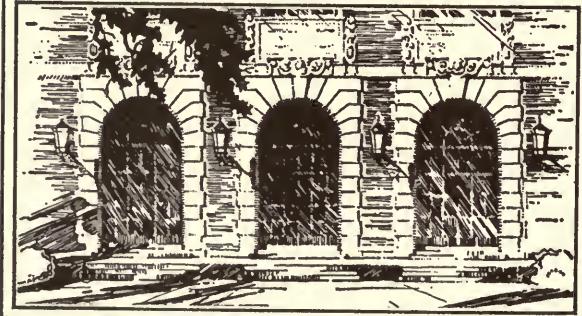
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Published by

CHICAGO NATURAL HISTORY MUSEUM

Volume 39

OCTOBER 27, 1961

No. 55

Status of the Frog *Hyla albomarginata* in Central America

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One of the common treefrogs of the Caribbean drainage of isthmic Panama is a moderate-sized green *Hyla* with bright red-orange webs. This form has been referred to *Hyla albomarginata* by Cope (1886) in Nicaragua, by Taylor (1952) and others in Costa Rica, and by Dunn (1931a, b) in Panama. Dunn (1931a) and Wettstein (1934) pointed out differences which they believed might indicate racial distinction, and Taylor (1952) also suggested that this Central American form might not be identical with the South American species originally described by Spix (1824) as *Hyla albomarginata* (type locality, "Bahia"). I have compared a series of specimens from Panama and Nicaragua with material from Brazil which conforms to published descriptions of Brazilian *albomarginata*. The Central American frogs differ in several respects, and probably represent a form specifically distinct from *H. albomarginata*. There seems no prior name available, so I propose to call this species

Hyla rufitela,² new species. Figure 108.

Holotype.—Chicago Natural History Museum no. 13453, adult male. Collected by K. P. Schmidt on Barro Colorado Island, Canal Zone, December 24, 1928.

Paratypes.—CNHM 13052, 13054, 13425, 13429–30, and TNHC 24089 (topotypes). TNHC 26700: Near the mouth of the Chagres River, Canal Zone. AMNH 7362–63: Maselina Creek, Nicaragua (tributary feeding the Machuco area of Río San Juan).

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² In reference to the reddish webbing between the digits.

Library of Congress Catalog Card Number: 61-17978

No. 934

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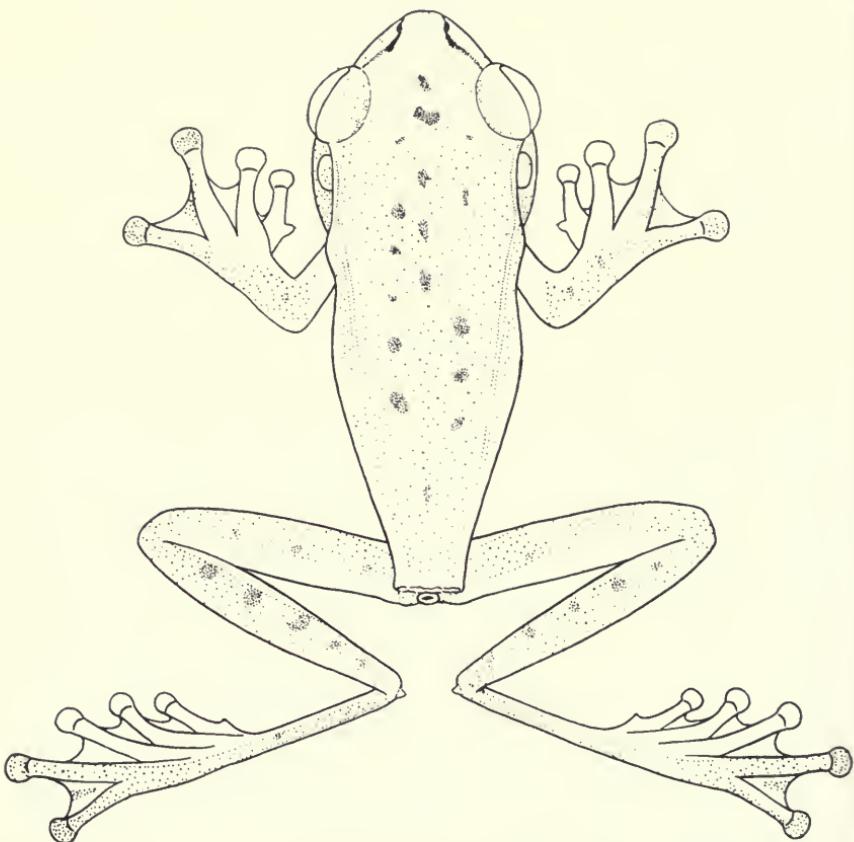


FIG. 108. *Hyla rufitela*, new sp., CNHM 13453, holotype.

Diagnosis.—A medium-sized *Hyla*, green above, with profuse, tiny, dark punctations and usually scattered dark spots; webs bright red-orange; concealed areas of axilla, groin and thigh bluish or blue-green, sometimes with red also; iris golden yellow. A distinct pollex rudiment, bearing a spine in males. Fingers about one-half webbed, toes three-fourths webbed (fig. 109).

Description of holotype.—Greatest width of head slightly more than length (measured directly from tip of snout to posterior edge of tympanum); snout rounded with truncate tip, nostrils superolateral, slightly raised. Canthus distinct, loreal region somewhat concave and sloping obliquely. Eyes large and protruding, horizontal diameter about equal to their distance from the nostril. Interorbital distance equal to about one and one-half times width of upper

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eyelid, or about diameter of eye. Internarial distance about three-fourths of distance from nostril to eye, or about equal to width of eyelid. Tympanum distinct, round, but upper edge hidden under a fold of skin from posterior border of eye. Horizontal diameter of tympanum about one-half that of eye, separated from eye by about one-half the diameter of tympanum. Top of head relatively flattened (actually slightly concave). Vomerine teeth in two large oblique

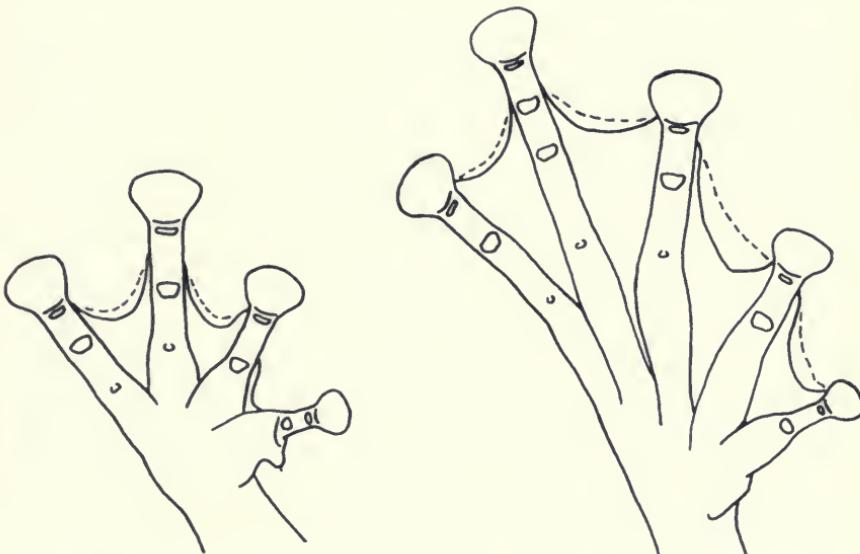


FIG. 109. Ventral aspects of hand (left) and foot (right) of *Hyla rufitela* (not to scale). The drawings indicate the relative positions of the subarticular tubercles and the extent of the webbing. The dotted lines indicate the extent of webbing in *Hyla albomarginata*, for comparison.

rows, only slightly separated medially, each row posteromedial to the choana of that side, and parallel to the long axis of that choana. Tongue broad, only slightly longer than wide, with an indistinct notch on posterior free edge. A pair of elongate vocal slits parallel and adjacent to mandible, extending along posterior half of jaw.

Skin relatively smooth above, finely granular. Glandular fold from posterior border of eye across upper edge of tympanum, passing down obliquely behind tympanum to a point immediately behind angle of jaw; here a vague connection over the axilla with a rather distinct ventrolateral fold. A weak dorsolateral fold from above axilla to sacrum. A transverse fold above vent. Arm of moderate length, wrist reaching to about end of snout. Lower arm stout.

Fingers about one-half webbed, but webbing reduced between the first two fingers (fig. 109); webs thickened. Finger 4 distinctly longer than 2, and nearly as long as 3. A well-developed pollex rudiment bearing a small spine. Discs of fingers 2, 3, and 4 large, each about twice the size of that of finger 1, and nearly as extensive as tympanum. Subarticular tubercles 2, 2, 3, 3, on fingers 1 through 4 respectively; distal tubercle of each digit slightly developed; proximal tubercle of fingers 3 and 4 very small and indistinct; other subarticular tubercles distinct. A faint glandular ridge along outer edge of arm and finger, passing around elbow. Legs moderately long, heel reaching tip of snout. Heels overlap slightly when legs are placed at right angles to body, and knee and elbow overlap slightly when leg is placed alongside body. Toes three-fourths webbed (fig. 109), the webbing thick. Toes 3 and 5 about equal in length. Discs well developed, but the largest slightly smaller than the largest finger disc; disc of toe 1 about one-half the size of the others. Subarticular tubercles 2, 2, 3, 4, 3 on toes 1 through 5 respectively; distal tubercle of each digit slightly developed; proximal tubercle of toes 3, 4, and 5 very small and indistinct; other subarticular tubercles quite distinct. A rather long, flat, inner metatarsal tubercle medial to inner toe, suggesting a rudimentary digit. A faint, outer tarsal fold, continued along outer edge of toe 5, and a poorly developed dermal pad on heel. Venter coarsely granular, throat skin smoother and more finely granular. An internal vocal sac.

Faded in preservative to a light yellowish color. Dorsal surfaces covered with profuse, tiny, dark brown punctations, which under magnification appear to be melanophores, imparting a finely speckled appearance. Some groups of these coalesced to form large spots scattered over upper surfaces of head, body, and limbs. A dark stripe marking canthus from eye to nostril, bordered below by an indistinct white line. The speckling occurs on nearly all normally exposed surfaces, including entire lip, tympanum, and upper surface of digits and discs. No pigment flecks laterally, ventrally, or on concealed surfaces of limbs, axilla, and groin, or on webs. Outer arm ridge, tarsal ridge, and anal fold white.

Measurements (mm.): snout-urostyle, 43.7; head length, 15.2; head width, 15.8; tibia, 23.7; heel to tip of longest toe, 32.0; eye, 5.5; tympanum, 2.7.

Variation in paratypes.—The number of large dorsal spots varies, some specimens showing more than the holotype, and some lacking them. The canthus may be more or less distinctly marked than in

the holotype. In one specimen the dorsolateral line is faintly marked with white. Five specimens exhibit some scattered, white dorsal spots. The cutaneous body folds are seldom more distinct than in the type, though often less so, and never so well defined as those of *H. albomarginata* (particularly the dorsolateral fold). The dorsolateral fold sometimes appears connected with the supratympanic fold. A distinct fold of skin may cross the chest, especially in males collected during the breeding season so that the throat skin is stretched from calling. The pollex rudiment is reduced in females; these also lack the spine. Variation in snout-urostyle of adults: males, 39.0 to 43.8; females, 46.3 to 47.6.

Color in life.—The following is based on color notes made on specimens I collected in the field (TNHC 24089, 26700). Dorsally a medium to light yellowish-green (darker at night when active in the field), with a profusion of tiny blackish flecks and a few larger scattered black or dark gray-green spots. Concealed surfaces of axilla, groin, and thigh bluish or bluish-green. Side yellow to yellow-green. Webs of fingers and toes a vivid red-orange. In one example the dorsolateral fold distinctly marked with cream, a distinct cream-white line from eye to nostril, and traces of reddish above eyes, along dorsolateral fold, and on concealed surfaces of thighs. In the other example the cream markings not visible, nor any red except in webs. Greenish-white below. Iris golden yellow.

Mating call.—A rather loud "cluck" or "quack" of medium-low pitch, occasionally accompanied by a guttural trill (the latter probably a "warm up" call). Audiospectrographic analysis (by Kay Electric Co. Sonagraph) of calls recorded from a single individual (TNHC 24089) indicates that the typical call is a single short note (mean duration about 0.06 second) (fig. 110). This note is well-tuned, with a fundamental frequency averaging about 400 cycles per second (actually rising from about 375 to about 425 during its duration). The fourth harmonic (considering the fundamental as the first) is dominant (midpoint about 1600 cps), but the third and fifth are also rather strongly resonated. The notes are repeated rather regularly at a rate of 43.1 per minute (based on a recorded series of 14 notes).

Relationships.—*Hyla rufitela* appears to be very closely related to *H. albomarginata*. It is distinguished from *albomarginata* by reduced skin pigmentation, iris color (silver in *albomarginata*), smaller size, a more pronounced pollex rudiment, and less distinct cutaneous folds of limbs and body. In addition, the webbing is generally somewhat

less extensive, especially between the toes (fig. 109). There are no available recordings of the call of Brazilian *H. albomarginata*; however, Cochran's (1955) characterization of this call does not seem to me an apt description of the call of *H. rufitela*. Because of the demonstrated significance of the mating call as an isolating mechanism and consequently as a taxonomic character in anurans, it would be highly desirable to analyze the call of the Brazilian form

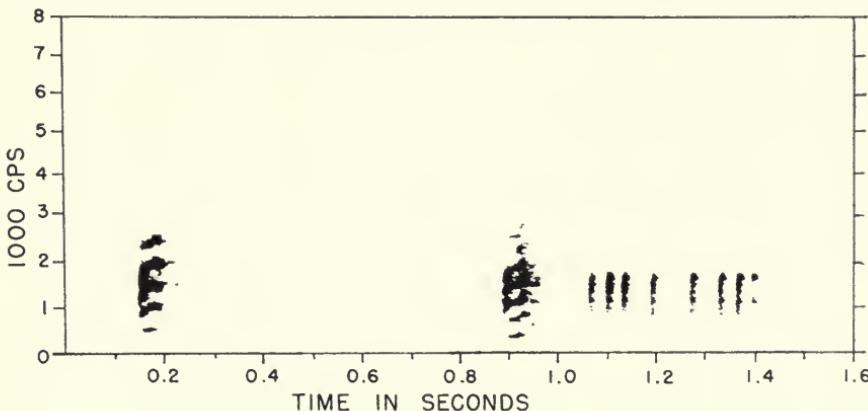


FIG. 110. Audiospectrogram (sonagram) of the mating call of *Hyla rufitela*. The second note is followed by a "warm-up" trill. The frog was calling from a leaf of a "pita" plant (*Ananas magdalena*e). Recorded at Barro Colorado Island, Canal Zone, August 21, 1956.

for comparison. Such analysis should provide more critical evidence for evaluating the relationship of these two frogs.

Remarks.—Ecologically *H. rufitela* is an inhabitant of lowland rain forest, at least in Panama. Its apparent restriction to the Caribbean forests indicates a hygric affinity, as this coast receives considerably more rainfall than the Pacific side.

Hyla rufitela is presently known from Nicaragua, Costa Rica, and Panama, and all localities which can be located are in the Caribbean drainage, at low elevation. I examined three of the four specimens reported from Colombia by Cochran (1955) as *H. albomarginata*, and these small, poorly preserved specimens may be related to *albomarginata* and *rufitela*, but are not conspecific with either. Specimens represented by USNM 65438 and 65439 appear to be identical and differ from *rufitela* in having a more rugose, coarsely granular skin dorsally, no indication of speckling, toes only about one-third webbed, pollex rudiment much reduced, and no supratympanic fold or any other cutaneous folds except a ventrolateral one. USNM 107639

differs from *rufitela* chiefly in having the vomerine teeth arranged in transverse rows, reduced finger webbing, and tympanum not so distinct. This specimen is from the mountains north of Cali. The fourth Colombian specimen (Musée Royale d'Histoire Naturelle [Brussels] No. 12175) was not examined. However, it, too, was collected in the mountains; thus it is ecologically improbable that it is *rufitela*. The specimens reported by Cochran (1955) from Ecuador were not examined, but on a geographic basis it is unlikely that these are either *rufitela* or *albomarginata*. I know of no specimens of *rufitela* from Panama south (east) of the Canal Zone. Coleman J. Goin, who is intensively studying the treefrogs of Colombia, informs me that he knows of no Colombian specimens which can be allocated to *rufitela* or *albomarginata*, so it is doubtful that the present ranges of these two forms overlap.

ACKNOWLEDGMENTS

Coleman Goin called my attention to this problem, provided comparative material, and offered valuable advice. The following individuals and institutions kindly lent specimens: Robert F. Inger, Chicago Natural History Museum (CNSM); Charles M. Bogert, American Museum of Natural History (AMNH); and W. Frank Blair, University of Texas Natural History Collection (TNHC); U. S. National Museum (USNM). The drawing of the holotype is by Miss Esther Coogle.

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